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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/537,290	06/22/2005	Taku Hirayama	2005_0892A	1862

513 7590 10/03/2007  
WENDEROTH, LIND & PONACK, L.L.P.  
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SUITE 800  
WASHINGTON, DC 20006-1021

EXAMINER
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LEE, SIN J

ART UNIT	PAPER NUMBER
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1752

MAIL DATE	DELIVERY MODE
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10/03/2007

PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

<b>Office Action Summary</b>	<b>Application No.</b> 10/537,290	<b>Applicant(s)</b> HIRAYAMA ET AL.	
	<b>Examiner</b> Sin J. Lee	<b>Art Unit</b> 1752	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

#### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

- 1) ☒ Responsive to communication(s) filed on 01 June 2005.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

- 4) ☒ Claim(s) 1-15 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-15 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

#### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

#### Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All    b) ☐ Some \*    c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

#### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)  | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)   | 5) <input type="checkbox"/> Notice of Informal Patent Application                       |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)<br>Paper No(s)/Mail Date <u>6/1/05, 6/22/05</u> | 6) <input type="checkbox"/> Other: _____  |

## DETAILED ACTION

### ***Claim Rejections - 35 USC § 103***

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 1-4 and 6-15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Gronbeck et al (US 6,803,171 B2).

Gronbeck teaches silsesquioxane-containing polymers suitable for use in bilayer resist systems (see col.3, lines 22-28). Specifically, in Example 30, Gronbeck teaches a terpolymer containing repeating units of phenylsilsesquioxane, hydroxybenzylsilsesquioxane and t-butoxycarbonato benzylsilsesquioxane (the t-butoxycarbonato group being a photoacid-labile ester group). Gronbeck teaches the equivalence of the photoacid labile ester group and a photoacid labile acetal group such as the one formed by grafting t-butylvinyl ether onto a phenolic hydroxyl moiety (see col.8, lines 44-64 and claim 2). Therefore, it would have been obvious to one skilled in the art to use a terpolymer having repeating units of phenylsilsesquioxane, hydroxybenzylsilsesquioxane and t-butoxy benzylsilsesquioxane in Gronbeck's polymer in his Example 30 with a reasonable expectation of obtaining a bilayer resist that has controlled dissolution rate with little or no loss of photospeed. Gronbeck's composition of Example 30 contains his terpolymer, a photoacid generator and a quencher. Gronbeck teaches coating his photoimageable composition onto a bottom layer (such

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as novolac polymer-based resist) which is applied onto a substrate (see col.23, lines 5-21). Gronbeck's photoimageable composition is then exposed and then developed (see col.23, lines 22-51). Thus, Gronbeck's teaching renders obvious present inventions of claims 1, 3, 4, 6-10 and 12-15.

Even though Gronbeck's polymer in Example 30 contains 5% phenylsilsesquioxane unit, Gronbeck also teaches that such unit can be present in the amount of 5, 10 or 20-30 or 40-50% based on total units of the polymer (see col.10, lines 22-37). Thus, it would have been obvious to one skilled in the art to use 10% of phenylsilsesquioxane unit in Gronbeck's polymer in his Example 30 with a reasonable expectation of obtaining a bilayer resist that has controlled dissolution rate with little or no loss of photospeed. Therefore, Gronbeck's teaching also renders obvious present inventions of claims 2 and 11.

3. Claim 5 is rejected under 35 U.S.C. 103(a) as being unpatentable over Gronbeck et al (US 6,803,171 B2) in view of Thackeray et al (5,827,634).

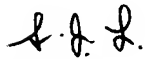
Although Gronbeck does not teach the use of present dissolution inhibitor, it is known in the art to use such compound in a positive resist composition in order to improve the contrast and resolution of the resist as taught by Thackeray (see Example 3). Thus, Gronbeck in view of Thackeray render obvious present invention of claim 5.

4. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Sin J. Lee whose telephone number is 571-272-1333. The examiner can normally be reached on Monday-Friday from 9:00 am EST to 5:30 pm EST.

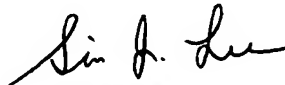
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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Cynthia Kelly, can be reached on 571-272-1526. The fax phone number for the organization where this application or proceeding is assigned is **571-273-8300**.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



S. Lee  
September 30, 2007

  
**SIN LEE**  
**PRIMARY EXAMINER**